FOREST STATISTICS

FOR MONONGAHELA SECTION, WEST VIRGINIA

Northeastern
Forest Experiment Station
Upper Darby, Pa.
V.L. Harper, Director

FOREST SURVEY RELEASE No. 6

MAY 1949

This is the sixth in a series of Forest Survey statistical releases to be published by the Northeastern Forest Experiment Station. The prior releases in the series are:

No. 1 - Forest Resources of Elk, Forest, McKean, and Warren Counties, Pennslyvania

No. 2 - Forest Statistics for Pendleton, Pocahontas, and Randolph Counties, West Virginia

No. 3 - Forest Statistics for Northern New Hampshire

No. 4 - Forest Statistics for Hancock County, Maine

No. 5 - Forest Statistics for Southern New Hampshire

R-NRM
Special
Statistical Seminar

January 20, 1938

CACTUS JOINTS ON PAIRED PLOTS

Plot no.	Burned	Unburned
1	123	186
2	2	211
3	6	21
4	0	557
5	216	363
6	13	306
7	6	629
8	76	687
9	9	192
10	121	143
11	75	63
12	56	17
13	94	153
14	30	0
15	12	50
16	13	1
17	210	140
18	35	80
19	17	76
20	4	18
21	39	143
22	7	158
23	105	188
24	1	425
25	14	606
26	65	189
27	13	29
28	73	164
29	47	43
30	221	397
31	211	133

~~5,183~~ 5,877

~~2,572~~ 2,572

5,685

14,077

% of state area		Bd Ft volume (by Mid Ht)
20%	—	5,879
18	—	5,686
14	—	2,572
52		14,077

Reapproved should

8,783 million board feet for entire state

FOREWORD

This release contains statistics on forest area and timber volumes for Barbour, Harrison, Lewis, Marion, Monongalia, Preston, Taylor, Tucker, and Upshur Counties, West Virginia. Seven statistical tables on forest area and fifteen tables on timber volumes are included. These tables are followed by a brief description of Forest Survey procedure and estimates of the accuracy of forest-area and timber-volume figures. Because many of the terms used in this release have special meanings, an explanation of the terms used may be found at the end of the report.

This report was prepared by the Forest Survey organization at the Northeastern Forest Experiment Station under the direction of Frank A. Ineson, assisted by Harry W. Camp, Jr., in charge of inventory; Roland H. Ferguson, in charge of compilations; and Carl J. Holcomb, field supervisor. Volume table and accuracy analyses were made by C. Allen Bickford. Field-inventory work in these counties was completed in June 1948. A survey of public forest-land ownership was completed in March 1949. Field work was conducted by Thomas G. Clark, Adrian M. Gilbert, Ted J. Grisez, Alvin K. Wilson, and Robert D. Wray of the Forest Survey. They were assisted by Robert C. Kletzly, Kermit Kruse, Theodore R. Samsell, Carroll M. Smithson, and H. Lee Wilson of the West Virginia Conservation Commission.

This report is the second in a series of similar reports that are planned for other county groups within West Virginia. After survey findings for all the counties in the entire State have been reported in this manner, a statistical report for the State as a whole will be issued, presenting the findings of the Forest Survey on growth and commodity drain as well as on forest area and timber volume. Later, a comprehensive report will be published; in this the current forest situation and prospective changes will be analyzed.

The Forest Survey is conducted in the various forest regions by the forest experiment stations of the Forest Service. The project in the Northeast is directed by the Northeastern Forest Experiment Station, with central headquarters in Upper Darby, Pennsylvania.

The Station thanks the many individuals and agencies in West Virginia who cooperated in facilitating the forest survey. Special appreciation is due the West Virginia Conservation Commission for making aerial photographs available and for collaborating through the assignment of personnel in a joint forest and game-habitat survey.

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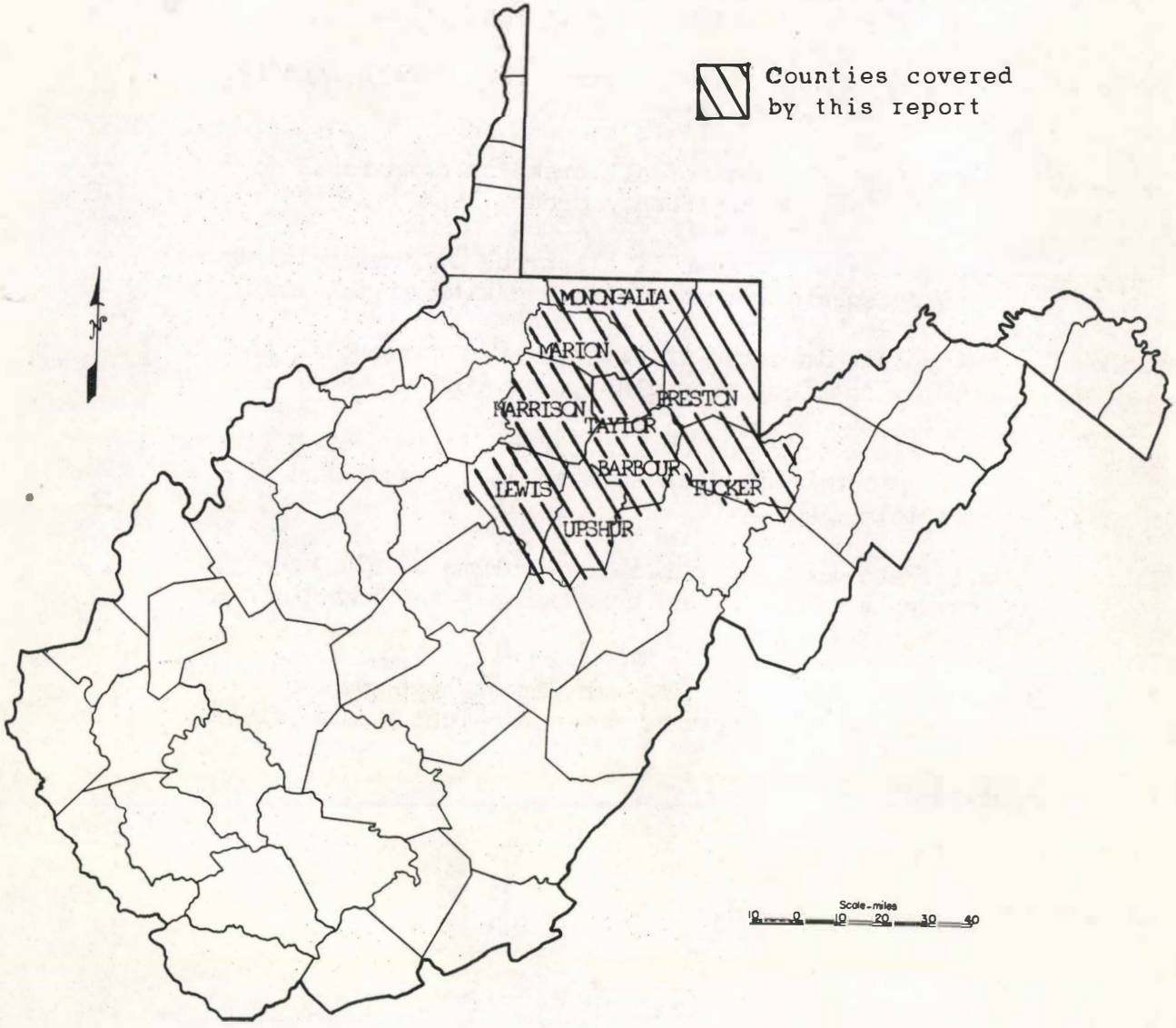
FOREST SURVEY IN WEST VIRGINIA

MAY 1949



Northeastern Forest Experiment Station

FOREST STATISTICS FOR
MONONGAHELA SECTION
WEST VIRGINIA

compiled by

Forest Survey Staff
Northeastern Forest Experiment Station

SALIENT STATISTICS

The Monongahela Section includes a nine-county area[1/] in the northern portion of West Virginia, all but 10 percent of which is drained by the Monongahela River system. The topography is generally rolling except for mountainous areas in Tucker and Preston Counties. These mountainous areas have a maximum elevation of 4,420 feet. The average elevation for the entire section is 1,660 feet. Precipitation averages 47 inches annually or four inches more than the average for the State.

These nine counties contain 14 percent of the total land area of the State, and 17 percent of the State's population. They had a population in 1940 of 326,854. Of this, about 26 percent resided on farms, 44 percent occupied rural homes but did not farm, and 30 percent was urban. The three principal cities are Clarksburg, Fairmont, and Morgantown (site of West Virginia University).

Mining, farming, and lumbering are the major industries. Coal-mining operations, including strippings, are found in all nine counties. Farming is confined mostly to raising livestock and growing hay, although truck farming has become important in the Canaan Valley in Tucker County within recent years. Lumbering is carried on in all nine counties; most of it is in Preston and Tucker Counties. Of the more than 400 mills in the entire section in 1942, one fourth were in Preston County. Most of these mills are small; they operate intermittently. Some do custom sawing exclusively.

Several main highways and many good secondary roads interlace the area and, except in the eastern portion, there is an extensive system of unpaved roads that are passable in all but the wettest weather. Four railroads serve the region.

1/ Barbour, Harrison, Lewis, Marion, Monongalia, Preston, Taylor, Tucker, and Upshur Counties.

Of the total land area of 2,187,500 acres, 47 percent is forest land. Only Preston and Tucker Counties are more than half forested. All of this forest area has been rated as productive, although 3,300 acres have been withdrawn from commercial use. The remaining 1,030,500 acres are classified as commercial forest land.

Forest land ownership.--About 11 percent of the commercial forest area, or 108,000 acres, is publicly owned: 94,700 acres are in the Monongahela National Forest, while the State, counties, and municipalities own 13,300 acres. Privately owned commercial forest land falls into two classifications: farm woodland, which occupies 348,000 acres, and industrial and other private ownership, 574,200 acres.

Forest type groups.--The forest types of these counties have been divided into four principal type groups. The oak-hickory types cover 40 percent of the commercial forest area; they are generally on southern and western exposures. The principal species are white oak on the lower, gentler slopes, red oak at moderate elevations, and chestnut oak on the high, dry ridges. The hickories and red maple are common associates. Chestnut formerly grew on much of the area now covered by these types.

The cove hardwood type occupies about 35 percent of the commercial forest area. It usually occurs on the deep, moist sites in the coves and extends up the lower slopes. The boundary between the cove hardwood type and the northern hardwood and oak-hickory types is seldom distinct. The latter types are generally located on the upper slopes and ridges above the coves. Species such as beech, red oak, hickory, and sugar maple are commonly found intermingled with yellow-poplar in the coves of this section.

The northern hardwood type, comprising 21 percent of the commercial forest area, is usually found on the higher elevations. Beech, yellow birch, and sugar maple are the characteristic species; the usual associates are red oak, red maple, black cherry, and hickory. The aspen type is found on about 2 percent of the commercial forest area.

The softwood type group makes up only 2 percent of the commercial forest area. This group consists of mixed stands of red spruce, red maple, and yellow birch, and pure stands of hemlock, both of which occur chiefly at elevations above 3,200 feet.

Site quality.--Forest soils vary in productivity according to topography, climate, parent material, and treatment. Tree height growth is an accepted criterion for comparing the relative productivity of various sites. About 65 percent of the area is rated as fair site, capable of growing one and one-half to three 16-foot logs in hardwood trees or three to five in softwoods. A little more than 23 percent of the area is considered better than this, while the remainder is poor site. More than 40 percent of the cove hardwood type is found on good sites, whereas less than 15 percent of the northern hardwood and oak types are so classified.

Stand-size classes.--Logging began late in the 19th century and has continued without interruption to the present. In the first cuttings, the loggers "high-graded" the stands for white oak and yellow-poplar; they took the tallest and straightest trees for gas and oil-well derricks and mining timbers. In this way many white oak and cove hardwood stands were converted to the red oak type. Cutting of the original stands of red spruce and hemlock was often followed by fire, thereby discouraging reproduction of these species and greatly reducing the area now occupied by these types.

About 39 percent of the commercial forest area is in saw-timber stands containing 1,500 board feet or more per acre. The medium and heavy saw-timber stands average 9,020 board feet per acre and the light saw-timber stands 3,320 board feet per acre. They contain also an additional 14 and 12 cords of smaller material per acre respectively. Pole-timber stands, stands at least 10 percent stocked with trees of pole size or larger, make up 37 percent of the commercial forest area. These stands contain an average of 740 board feet of saw timber per acre and 8 cords of other material. The remaining area is about equally distributed between seedling and sapling stands and poorly stocked forest land.

Sawlog volume.--In the nine counties there is a total of 2,512,000,000 board feet of sawlog material plus 108,200,000 board feet of dead chestnut. Eighty-seven percent of the live-tree sawlog volume is found in saw-timber stands. It is not economical to log much of this material at present as it is located in small, widely separated stands with low volumes or in scattered low-quality trees left from earlier logging operations.

Hardwoods account for 98 percent of the sawlog volume, the principal species being red oak, yellow-poplar, beech, hickory, chestnut oak, white oak, and sugar maple. Hemlock is the most prominent softwood species; red spruce is next. About 37 percent of the hardwood sawlog volume is in trees 19 inches in diameter and larger, but only 16 percent of the softwood volume is in trees this large.

All sawlog volumes are net, deductions having been made for decay and deformities. The average cull for all saw-timber trees is about 10 percent. No board-foot volume estimates are included for cull trees.

Volume in cords.--The total net volume in live trees 5.0 inches and larger (outside bark) on commercial forest land is 15,318,000 cords. In addition to this about 515,000 cords of dead chestnut were found. Of the total live-tree volume, 44 percent is found in sawlog material, 13 percent in the upper stems and limbs of saw-timber trees, 33 percent in pole-timber trees, and 10 percent in the sound volume of cull trees. Two percent of the volume is in nonmerchantable species such as sassafras and sourwood.

Cubic-foot volume.--The solid wood content of trees may also be expressed in cubic feet as well as in cords. All live trees 5.0 inches in diameter and larger (outside bark) contain 999,100,000 cubic feet, or an average of 970 cubic feet per acre of commercial forest land.

Table 1.--Commercial and noncommercial forest area by county group, 1948

Kind of land	Barbour Taylor Tucker Upshur	Harrison Lewis Marion Monongalia	Preston	Total	
	Acres	Acres	Acres	Acres	Percent
Forest:					
Commercial	443,600	336,000	250,900	1,030,500	47.1
Noncommercial:					
Reserved productive	3,000	100	200	3,300	0.2
Nonproductive	--	--	--	--	--
Total	3,000	100	200	3,300	0.2
Total forest	446,600	336,100	251,100	1,033,800	47.3
Nonforest	378,300	613,700	161,700	1,153,700	52.7
All land[1/]	824,900	949,800	412,800	2,187,500	100.0

1/ From Areas of the United States, 1940, Bureau of the Census.

Table 2.--Forest and nonforest area by county, 1948

County	Forest area 1/		Nonforest area		Total land area
	Acres	Percent	Acres	Percent	Acres
Barbour	77,800	35.7	140,400	64.3	218,200
Harrison	62,100	23.2	205,400	76.8	267,500
Lewis	85,900	34.2	165,000	65.8	250,900
Marion	79,100	40.0	118,700	60.0	197,800
Monongalia	109,000	46.7	124,600	53.3	233,600
Preston	251,100	60.8	161,700	39.2	412,800
Taylor	42,700	38.1	69,300	61.9	112,000
Tucker	223,800	83.1	45,600	16.9	269,400
Upshur	102,300	45.4	123,000	54.6	225,300
Total	1,033,800	47.3	1,153,700	52.7	2,187,500

1/ Includes both commercial and noncommercial forest area.

Table 3.--Commercial forest area by ownership class and county group, 1948

Ownership class	Barbour Taylor Tucker Upshur	Harrison Lewis Marion Monongalia	Preston	Total	
	Acres	Acres	Acres	Acres	Percent
Federal:					
National forest	90,800	--	3,900	94,700	9.2
Other	300	--	--	300	--
Total Federal	91,100	---	3,900	95,000	9.2
State, county, and municipal	200	7,800	5,300	13,300	1.3
Private:					
Farm woodland 1/	127,600	123,600	96,800	348,000	33.8
Other	224,700	204,600	144,900	574,200	55.7
Total private	352,300	328,200	241,700	922,200	89.5
All ownerships	443,600	336,000	250,900	1,030,500	100.0

1/ Census of Agriculture: 1945.

Table 4.--Commercial forest area by forest type and county group, 1948

Forest type	Barbour Taylor Tucker Upshur	Harrison Lewis Marion Monongalia	Preston	Total	
	Acres	Acres	Acres	Acres	Percent
Softwood:					
Hemlock	5,600	--	--	5,600	0.5
Spruce-hardwood	12,100	--	--	12,100	1.2
Total	17,700	--	--	17,700	1.7
Northern hardwood:					
Aspen	18,500	--	--	18,500	1.8
Northern hardwood	122,900	17,500	73,700	214,100	20.8
Total	141,400	17,500	73,700	232,600	22.6
Cove hardwood:					
Cove hardwood	136,500	165,400	57,200	359,100	34.8
River bottom hardwood	---	3,900	--	3,900	.4
Total	136,500	169,300	57,200	363,000	35.2
Oak-hickory:					
Chestnut oak	8,300	33,200	17,800	59,300	5.8
White oak	38,700	29,200	41,900	109,800	10.6
Red oak	101,000	86,800	60,300	248,100	24.1
Total	148,000	149,200	120,000	417,200	40.5
All types	443,600	336,000	250,900	1,030,500	100.0

Table 5.--Commercial forest area by county group, forest type group, and stand-size class, 1948

BARBOUR, TAYLOR, TUCKER, AND UPSHUR COUNTIES

Stand-size class	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	Acres	Acres	Acres	Acres	Acres
Saw-timber stands:					
Medium and heavy	--	17,400	41,200	29,800	88,400
Light	--	32,900	25,000	36,100	94,000
Pole-timber stands	17,700	45,400	50,300	32,900	146,300
Seedling and sapling	--	--	7,800	23,600	31,400
Poorly stocked stands	--	45,700	12,200	25,600	83,500
All stands	17,700	141,400	136,500	148,000	443,600
HARRISON, LEWIS, MARION, AND MONONGALIA COUNTIES					
Saw-timber stands:					
Medium and heavy	--	6,600	11,700	20,100	38,400
Light	--	--	45,200	41,400	86,600
Pole-timber stands	--	10,900	71,400	34,600	116,900
Seedling and sapling	--	--	26,400	31,300	57,700
Poorly stocked stands	--	--	14,600	21,800	36,400
All stands	--	17,500	169,300	149,200	336,000
PRESTON COUNTY					
Saw-timber stands:					
Medium and heavy	--	9,900	3,300	9,800	23,000
Light	--	16,600	20,800	33,200	70,600
Pole-timber stands	--	37,900	28,000	52,200	118,100
Seedling and sapling	--	--	5,100	15,500	20,600
Poorly stocked stands	--	9,300	--	9,300	18,600
All stands	--	73,700	57,200	120,000	250,900
NINE-COUNTY TOTAL					
Saw-timber stands:					
Medium and heavy	--	33,900	56,200	59,700	149,800
Light	--	49,500	91,000	110,700	251,200
Pole-timber stands	17,700	94,200	149,700	119,700	381,300
Seedling and sapling	--	--	39,300	70,400	109,700
Poorly stocked stands	--	55,000	26,800	56,700	138,500
All stands	17,700	232,600	363,000	417,200	1,030,500

Table 6.--Commercial forest area by forest type group and site class, 1948

Forest type group	Site class			All sites
	Good	Fair	Poor	
	Acres	Acres	Acres	Acres
Softwood	--	--	17,700	17,700
Northern hardwood	31,300	153,800	47,500	232,600
Cove hardwood	149,600	199,300	14,100	363,000
Oak-hickory	58,500	320,500	38,200	417,200
All types	239,400	673,600	117,500	1,030,500
Percent	23.2	65.4	11.4	100.0

Table 7.--Commercial forest area by watershed and stand-size class, 1943

Stand-size class	Watershed			Total	
	Kanawha	Monongahela	Youghiogheny		
	Acres	Acres	Acres	Acres	Percent
Saw-timber stands:					
Medium and heavy	1,700	144,800	3,300	149,800	14.5
Light	23,400	223,600	4,200	251,200	24.4
Pole-timber stands	29,500	337,700	14,100	381,300	37.0
Seedling and sapling	9,000	100,700	--	109,700	10.6
Poorly stocked stands	14,300	124,200	--	138,500	13.5
All stands	77,900	931,000	21,600	1,030,500	100.0
Percent	7.6	90.3	2.1	100.0	--

Table 8.--Net board-foot volume on commercial forest land by forest type group, stand-size class, and species group, 1948

(Log scale, International 1/4-inch rule)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.
Saw-timber stands:					
Medium and heavy					
Softwood	--	14,600	--	--	14,600
Hardwood	--	308,600	493,800	533,700	1,336,100
Total	--	323,200	493,800	533,700	1,350,700
Light					
Softwood	--	13,800	--	--	13,800
Hardwood	--	136,300	321,300	361,900	819,500
Total	--	150,100	321,300	361,900	833,300
Pole-timber stands					
Softwood	4,600	19,400	4,800	--	28,800
Hardwood	--	53,400	113,300	87,500	254,200
Total	4,600	72,800	118,100	87,500	283,000
Other stands[1/]					
Softwood	--	--	--	--	--
Hardwood	--	3,600	--	41,400	45,000
Total	--	3,600	--	41,400	45,000
All stands					
Softwood	4,600	47,800	4,800	--	57,200
Hardwood	--	501,900	928,400	1,024,500	2,454,800
Total	4,600	549,700	933,200	1,024,500	2,512,000
Percent	0.2	21.9	37.1	40.8	100.0

1/ Includes seedling and sapling stands, poorly stocked stands, and unstocked areas.

Table 9.--Average net board-foot volume per acre on commercial forest land by forest type group, stand-size class, and species group, 1948

(Log scale, International 1/4-inch rule)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	Bd.ft.	Bd.ft.	Bd.ft.	Bd.ft.	Bd.ft.
Saw-timber stands:					
Medium and heavy					
Softwood	--	430	--	--	100
Hardwood	--	9,100	8,790	8,940	8,920
Total	--	9,530	8,790	8,940	9,020
Light					
Softwood	--	280	--	--	60
Hardwood	--	2,750	3,530	3,270	3,260
Total	--	3,030	3,530	3,270	3,320
Pole-timber stands					
Softwood	260	210	30	--	70
Hardwood	--	560	760	730	670
Total	260	770	790	730	740
Other stands					
Softwood	--	--	--	--	--
Hardwood	--	70	--	330	180
Total	--	70	--	330	180
All stands					
Softwood	260	200	10	--	60
Hardwood	--	2,160	2,560	2,460	2,380
Total	260	2,360	2,570	2,460	2,440

Table 10.--Net volume in cords of sawlog material on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:					
Medium and heavy					
Softwood	--	32	--	--	32
Hardwood	--	907	1,310	1,413	3,630
Total	--	939	1,310	1,413	3,662
Light					
Softwood	--	32	--	--	32
Hardwood	--	441	853	948	2,242
Total	--	473	853	948	2,274
Pole-timber stands					
Softwood	11	44	12	--	67
Hardwood	--	151	289	266	706
Total	11	195	301	266	773
Other stands					
Softwood	--	--	--	--	--
Hardwood	--	9	--	97	106
Total	--	9	--	97	106
All stands					
Softwood	11	108	12	--	131
Hardwood	--	1,508	2,452	2,724	6,684
Total	11	1,616	2,464	2,724	6,815
Percent	0.1	23.7	36.2	40.0	100.0

Table 11.--Average number of cords per acre of sawlog material on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	Cords	Cords	Cords	Cords	Cords
Saw-timber stands:					
Medium and heavy					
Softwood	--	0.9	--	--	0.2
Hardwood	--	26.8	23.3	23.7	24.2
Total	--	27.7	23.3	23.7	24.4
Light					
Softwood	--	0.6	--	--	0.1
Hardwood	--	8.9	9.4	8.6	8.9
Total	--	9.5	9.4	8.6	9.0
Pole-timber stands					
Softwood	0.6	0.5	0.1	--	0.2
Hardwood	--	1.6	1.9	2.2	1.8
Total	0.6	2.1	2.0	2.2	2.0
Other stands					
Softwood	--	--	--	--	--
Hardwood	--	0.2	--	0.8	0.4
Total	--	0.2	--	0.8	0.4
All stands					
Softwood	0.6	0.4	--	--	0.1
Hardwood	--	6.5	6.8	6.5	6.5
Total	0.6	6.9	6.8	6.5	6.6

Table 12.--Net volume in cords of material other than sawlog on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:					
Medium and heavy					
Softwood	--	10	--	1	11
Hardwood	--	582	730	825	2,137
Total	--	592	730	826	2,148
Light					
Softwood	--	7	--	--	7
Hardwood	--	581	1,093	1,242	2,916
Total	--	588	1,093	1,242	2,923
Pole-timber stands					
Softwood	71	35	3	--	109
Hardwood	29	781	1,213	1,061	3,084
Total	100	816	1,216	1,061	3,193
Other stands					
Softwood	--	--	--	--	--
Hardwood	--	16	78	145	239
Total	--	16	78	145	239
All stands					
Softwood	71	52	3	1	127
Hardwood	29	1,960	3,114	3,273	8,376
Total	100	2,012	3,117	3,274	8,503
Percent	1.2	23.6	36.7	38.5	100.0

Table 13.--Average number of cords per acre of material other than sawlog on commercial forest land by forest type group, stand-size class, and species group, 1948

(Standard cords, including bark)

Stand-size class and species group	Forest type group				All forest types
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory	
	Cords	Cords	Cords	Cords	Cords
Saw-timber stands:					
Medium and heavy					
Softwood	--	0.3	--	--	0.1
Hardwood	--	17.2	13.0	13.8	14.3
Total	--	17.5	13.0	13.8	14.4
Light					
Softwood	--	0.1	--	--	--
Hardwood	--	11.7	12.0	11.2	11.6
Total	--	11.8	12.0	11.2	11.6
Pole-timber stands					
Softwood	4.0	0.4	--	--	0.3
Hardwood	1.6	8.3	8.1	8.9	8.1
Total	5.6	8.7	8.1	8.9	8.4
Other stands					
Softwood	--	--	--	--	--
Hardwood	--	0.3	1.2	1.1	1.0
Total	--	0.3	1.2	1.1	1.0
All stands					
Softwood	4.0	0.2	--	--	0.1
Hardwood	1.6	8.4	8.6	7.8	8.1
Total	5.6	8.6	8.6	7.8	8.2

Table 14.--Net board-foot volume on commercial forest land by species and stand-size class, 1948

(Log scale, International 1/4-inch rule)

Species	Saw-timber stands	Pole-timber stands	Other stands	Total	
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.	Percent
Softwoods:					
Spruce	4,500	5,000	--	9,500	0.4
Hemlock	23,900	23,800	--	47,700	1.9
All softwoods	28,400	28,800	--	57,200	2.3
Hardwoods:					
Sugar maple	140,600	3,800	3,600	148,000	5.9
Red maple	28,500	31,900	--	60,400	2.4
Red oak	585,600	36,900	13,900	636,400	25.3
White oak	158,800	21,600	2,500	182,900	7.3
Chestnut oak	188,600	15,100	13,700	217,400	8.7
Yellow birch	54,900	10,100	--	65,000	2.6
Beech	267,000	9,600	--	276,600	11.0
Ash	19,600	6,000	--	25,600	1.0
Basswood	32,300	5,600	--	37,900	1.5
Black cherry	50,800	30,600	--	81,400	3.2
Yellow-poplar	264,500	49,000	--	313,500	12.5
Hickory	221,300	2,200	2,100	225,600	9.0
Buckeye	29,100	--	--	29,100	1.2
Elm	34,300	2,000	--	36,300	1.4
Gum	23,400	--	--	23,400	.9
Black walnut	8,100	14,300	4,900	27,300	1.1
Black locust	20,100	--	4,300	24,400	1.0
Other hardwoods	28,100	15,500	--	43,600	1.7
All hardwoods	2,155,600	254,200	45,000	2,454,800	97.7
All species[1/]	2,184,000	283,000	45,000	2,512,000	100.0
Percent	86.9	11.3	1.8	100.0	--

1/ In addition there are 108,200,000 board feet of dead chestnut: 96,600,000 in saw-timber stands, 9,800,000 in pole-timber stands, and 1,800,000 in poorly stocked stands.

Table 15.--Net volume in cords of all trees on commercial forest land by species and stand-size class, 1948

(Standard cords, including bark)

Species	Saw-timber stands	Pole-timber stands	Other stands	Total	
	M cords	M cords	M cords	M cords	Percent
Softwoods:					
Spruce	15	28	--	43	0.3
Hemlock	67	148	--	215	1.4
All softwoods	82	176	--	258	1.7
Hardwoods:					
Sugar maple	726	91	16	833	5.4
Red maple	424	601	17	1,042	6.8
Red oak	2,237	340	54	2,631	17.3
White oak	740	211	29	980	6.4
Chestnut oak	851	348	46	1,245	8.1
Yellow birch	438	324	5	767	5.0
Beech	1,399	172	--	1,571	10.3
Ash	182	97	2	281	1.8
Basswood	275	54	--	329	2.1
Black cherry	256	346	23	625	4.1
Yellow-poplar	1,135	417	5	1,557	10.2
Hickory	1,024	190	14	1,228	8.0
Buckeye	84	--	--	84	.6
Elm	273	33	23	329	2.1
Gum	166	17	--	183	1.2
Black walnut	41	110	19	170	1.1
Black locust	151	155	52	1/358	2.3
Other hardwoods	523	284	40	1/847	5.5
All hardwoods	10,925	3,790	345	15,060	98.3
All species 2/	11,007	3,966	345	15,318	100.0
Percent	71.9	25.9	2.2	100.0	--

1/ Includes 329,000 cords of so-called nonmerchantable species such as sassafras and sourwood.

2/ In addition, there are 515,000 cords of dead chestnut: 418,000 in saw-timber stands, 86,000 in pole-timber stands, and 11,000 in poorly stocked stands.

Table 16.--Net board-foot volume on commercial forest land by species and county group, 1948

(Log scale, International 1/4-inch rule)

Species	Barbour Taylor Tucker Upshur	Harrison Lewis Marion Monongalia	Preston	Total
	M bd.ft.	M bd.ft.	M bd.ft.	M bd.ft.
Softwoods:				
Spruce	9,500	--	--	9,500
Hemlock	33,600	4,800	9,300	47,700
All softwoods	43,100	4,800	9,300	57,200
Hardwoods:				
Sugar maple	88,600	19,100	40,300	148,000
Red maple	24,600	16,600	19,200	60,400
Red oak	347,200	134,600	154,600	636,400
White oak	48,400	101,300	33,200	182,900
Chestnut oak	39,700	157,400	20,300	217,400
Yellow birch	47,800	1,000	16,200	65,000
Beech	213,500	14,700	48,400	276,600
Ash	9,800	12,300	3,500	25,600
Basswood	30,000	7,900	--	37,900
Black cherry	50,100	9,500	21,800	81,400
Yellow-poplar	172,700	86,700	54,100	313,500
Hickory	87,500	90,500	47,600	225,600
Buckeye	8,100	21,000	--	29,100
Elm	--	36,300	--	36,300
Gum	5,400	9,700	8,300	23,400
Black walnut	7,800	19,500	--	27,300
Black locust	10,100	14,300	--	24,400
Other hardwoods	17,700	16,500	9,400	43,600
All hardwoods	1,209,000	768,900	476,900	2,454,800
All species[1/]	1,252,100	773,700	486,200	2,512,000
Percent	49.8	30.8	19.4	100.0

1/ In addition there are 108,200,000 board feet of dead chestnut: 41,900,000 board feet in Preston County and 66,300,000 board feet in the other counties.

Table 17.--Net volume in cords of all trees on commercial forest land by species and county group, 1948

(Standard cords, including bark)

Species	Barbour Taylor Tucker Upshur	Harrison Lewis Marion Monongalia	Preston	Total
	M cords	M cords	M cords	M cords
Softwoods:				
Spruce	43	--	--	43
Hemlock	168	15	32	215
All softwoods	211	15	32	258
Hardwoods:				
Sugar maple	481	140	212	833
Red maple	463	322	257	1,042
Red oak	1,391	548	692	2,631
White oak	339	461	180	980
Chestnut oak	253	648	344	1,245
Yellow birch	505	5	257	767
Beech	1,069	100	402	1,571
Ash	161	77	43	281
Basswood	248	61	20	329
Black cherry	294	99	232	625
Yellow-poplar	825	405	327	1,557
Hickory	451	440	337	1,228
Buckeye	27	57	--	84
Elm	8	285	36	329
Gum	34	64	85	183
Black walnut	32	133	5	170
Black locust	146	150	62	358
Other hardwoods	425	271	151	847
All hardwoods	7,152	4,266	3,642	15,060
All species[1/]	7,363	4,281	3,674	15,318
Percent	48.1	27.9	24.0	100.0

1/ In addition there are 515,000 cords of dead chestnut: 183,000 cords in Preston County, and 332,000 cords in the other counties.

Table 18.--Net cubic-foot volume of all trees on commercial forest land by species, tree class, and kind of material, 1948

(Excluding bark)

Species	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cu.ft.	M cu.ft.	M cu.ft.	M cu.ft.	M cu.ft.
Softwoods:					
Spruce	1,700	600	1,100	--	3,400
Hemlock	8,500	2,000	6,000	300	16,800
All softwoods	10,200	2,600	7,100	300	20,200
Hardwoods:					
Sugar maple	26,600	7,400	15,200	4,900	54,100
Red maple	10,900	3,400	41,400	12,000	67,700
Red oak	108,700	30,100	28,100	4,100	171,000
White oak	30,100	9,400	23,700	500	63,700
Chestnut oak	36,200	11,500	19,700	13,500	80,900
Yellow birch	15,200	3,800	20,400	10,500	49,900
Beech	54,800	11,300	13,900	22,100	102,100
Ash	4,400	1,500	11,900	400	18,200
Basswood	7,000	2,000	11,000	1,400	21,400
Black cherry	15,300	5,100	16,500	3,800	40,700
Yellow-poplar	49,900	14,500	34,500	2,300	101,200
Hickory	43,700	10,300	23,900	1,900	79,800
Buckeye	4,400	1,100	---	--	5,500
Elm	6,100	3,000	11,000	1,300	21,400
Gum	4,600	1,300	3,200	2,800	11,900
Black walnut	4,800	2,300	2,900	1,000	11,000
Black locust	4,100	2,100	10,000	7,100	1/23,300
Other hardwoods	7,700	2,800	36,200	8,400	1/55,100
All hardwoods	434,500	122,900	323,500	98,000	978,900
All species 2/	444,700	125,500	330,600	98,300	999,100
Percent	44.5	12.6	33.1	9.8	100.0

1/ Includes 21,400,000 cubic feet of so-called nonmerchantable species such as sassafras and sourwood.

2/ In addition, there are 33,500,000 cubic feet of dead chestnut: 26,500,000 cubic feet in saw-timber trees and 7,000,000 cubic feet in pole-timber trees.

Table 19.--Net volume in cords of all trees on commercial forest land by species, tree class, and kind of material, 1948

(Standard cords, including bark)

Species	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cords	M cords	M cords	M cords	M cords
Softwoods:					
Spruce	22	7	14	--	43
Hemlock	109	25	77	4	215
All softwoods	131	32	91	4	258
Hardwoods:					
Sugar maple	408	113	235	77	833
Red maple	168	52	637	185	1,042
Red oak	1,673	463	432	63	2,631
White oak	462	145	365	8	980
Chestnut oak	557	177	303	208	1,245
Yellow birch	234	58	314	161	767
Beech	843	175	214	339	1,571
Ash	69	23	183	6	281
Basswood	107	32	168	22	329
Black cherry	235	78	254	58	625
Yellow-poplar	768	222	531	36	1,557
Hickory	672	159	368	29	1,228
Buckeye	67	17	--	--	84
Elm	94	46	170	19	329
Gum	70	21	49	43	183
Black walnut	74	36	45	15	170
Black locust	64	32	152	110	358
Other hardwoods	119	43	557	128	847
All hardwoods	6,684	1,892	4,977	1,507	15,060
All species 1/	6,815	1,924	5,068	1,511	15,318
Percent	44.5	12.6	33.0	9.9	100.0

1/ In addition, there are 515,000 cords of dead chestnut: 407,000 cords in saw-timber trees and 108,000 cords in pole-timber trees.

Table 20.--Net volume in cords of all trees on commercial forest land by stand-size class, tree class, and kind of material, 1948

(Standard cords, including bark)

Stand-size class	Saw-timber trees		Pole-timber trees	Cull trees	Total
	Sawlog material	Upper stems and limbs			
	M cords	M cords	M cords	M cords	M cords
Saw-timber stands:					
Medium and heavy	3,662	914	882	352	5,810
Light	2,274	689	1,702	532	5,197
Pole-timber stands	773	281	2,326	586	3,966
Other stands	106	40	158	41	345
All stands	6,815	1,924	5,068	1,511	15,318

Table 21.--Net board-foot and cubic-foot volume of all trees on commercial forest land by species group and diameter class, 1948

SOFTWOODS

Diameter class (inches)	Sawlog material (log scale, Int. 1/4-inch rule)		All material (excluding bark)	
	M bd.ft.	Percent	M cu.ft.	Percent
6	--	--	2,100	10.4
8	--	--	4,900	24.3
10	13,700	24.0	4,000	19.8
12	10,700	18.7	2,400	11.9
14	5,500	9.6	1,300	6.4
16	4,700	8.2	900	4.4
18	13,200	23.1	2,800	13.9
20 and over	9,400	16.4	1,800	8.9
All softwoods	57,200	100.0	20,200	100.0
HARDWOODS				
6	--	--	108,200	11.1
8	--	--	130,200	13.3
10	--	--	112,900	11.5
12	378,700	15.4	104,400	10.7
14	449,200	18.3	117,400	12.0
16	427,000	17.4	104,000	10.6
18	304,800	12.4	73,800	7.5
20	196,100	8.0	49,700	5.1
22	209,600	8.5	57,100	5.8
24	217,000	8.9	48,600	5.0
26	62,800	2.6	25,500	2.6
28	30,000	1.2	11,600	1.2
30 and over	179,600	7.3	35,500	3.6
All hardwoods	2,454,800	100.0	978,900	100.0
All species	2,512,000	--	999,100	--

Table 22.--Species composition of each forest type group, expressed in percent of net cubic-foot volume, 1948

Species	Forest type group			
	Softwood	Northern hardwood	Cove hardwood	Oak-hickory
	Percent	Percent	Percent	Percent
Softwoods:				
Spruce	18.4	0.8	--	--
Hemlock	59.0	4.4	0.3	--
All softwoods	77.4	5.2	0.3	--
Hardwoods:				
Sugar maple	--	10.7	5.8	1.9
Red maple	11.4	9.1	4.4	7.5
Red oak	--	10.2	10.0	28.4
White oak	--	.9	4.4	11.7
Chestnut oak	--	.8	3.0	17.4
Yellow birch	7.6	13.8	2.6	1.8
Beech	--	20.9	10.8	3.4
Ash	--	1.6	3.3	.6
Basswood	--	4.5	2.3	.6
Black cherry	--	5.9	3.3	3.8
Yellow-poplar	--	2.2	23.3	3.0
Hickory	--	5.7	7.0	10.4
Buckeye	--	2.1	.2	--
Elm	--	--	4.9	.9
Gum	--	1.7	1.1	1.0
Black walnut	--	.4	1.9	.8
Black locust	--	1.0	3.0	2.6
Other hardwoods	3.6	3.3	8.4	4.2
All hardwoods	22.6	94.8	99.7	100.0
All species	100.0	100.0	100.0	100.0

FOREST SURVEY PROCEDURE

These estimates of forest area and timber volume are based upon data obtained from a sampling of the nine counties. The following procedure was used:

Photo interpretation.--A large number of plots (about one to every 448 acres) were distributed regularly over the aerial photographs covering these counties. Photo interpreters first determined whether each plot was forest or nonforest. If forest, the stand in which the plot was located was examined through the stereoscope and classified as to forest type and stand-size class (based on stand volume and density).

Ground plot examination.--The next step was to examine on the ground enough 1/5-acre forest plots randomly selected from those previously examined on aerial photos in order to establish a reliable average volume per acre from a tally of trees by species and diameters at breast height. Estimates of cull, site quality, past use, and other items also were recorded from the ground plots. An average of about one ground plot was selected to every 4,838 acres of forest land.

Compilation of data.--Photo-interpretation and field-plot data were entered on punch cards in the Upper Darby office. Tabulations were made from these data, resulting in the set of tables herewith.

ACCURACY OF DATA

The number of observations taken on the aerial photographs and the number of ground plots examined in each stand-size class were designed to yield forest area and volume estimates of the highest practicable degree of sampling accuracy for the personnel and equipment available. Some errors in the forest inventory are inescapable because: (1) area classifications may be imperfect, and volume of sample trees is derived from measurements of diameter, height, and form, with adjustments for estimated defect; and (2) the estimated total is obtained by "blowing up" a sample.

Errors of the first class include: mistakes in measurement and judgment, imperfect volume tables, and possibly faulty adjustment for defects. Every effort was made to keep such errors to a minimum and compensating, but the degree to which this may have been attained cannot be measured satisfactorily. Errors of the second class are due to

failure of the sample to perfectly represent the whole. Such errors are measurable. The sampling errors for principal items for these counties as a whole are expressed below as percentages of their respective totals:

	Percent
Forest area	± 2.5
Saw-timber area	± 7.2
Pole-timber area	± 8.8
Total board-foot volume	± 7.9
Board-foot volume in saw-timber stands	± 10.2
Total cubic-foot volume	± 5.2
Cubic-foot volume in pole-timber stands	± 10.4

If we assume no bias and no systematic errors, it is reasonable to expect that actual areas and volumes will be within the indicated range of reported areas and volumes about two times in three, and within the range of two sampling errors about 19 times in 20. For example, the chances are about two out of three that the forest area would not differ more than 2.5 percent from that reported herein. The chances are about 19 in 20 that the forest area would not differ more than 5.0 percent or twice that for one sampling error. Corresponding statements may be made for each of the other items for which sampling errors are given.

Statistics of forest area by type, stand-size class, etc., reported in the tables herewith are subject to increasing sampling error as the class becomes finer and its numerical magnitude smaller. In general, experience to date indicates the ranges in area sampling error shown below:

Class area in acres	Approximate area sampling error in percent
Less than 50,000:	Variable, usually over 40
50,000 to 100,000:	Ordinarily between 20 and 40
100,000 to 300,000:	Usually between 10 and 20
More than 300,000:	Commonly less than 10, but may be as high as 20

Volume sampling errors are larger (in percentage) than area errors and have a tendency to vary by stand-size class. Sampling errors of

board-foot data are usually larger than corresponding errors in cubic-feet. The percentage additions that should generally be made to area sampling errors in order to estimate volume sampling errors are shown below:

Stand-size class	Volume sampling errors in relation to area sampling errors	
	For board feet	For cubic feet
	Percent	Percent
Saw timber:		
Medium and heavy	Add 1	Add 1
Light	Add 2	Add 1
Pole timber	Add 6 to 10	Add 2 to 3

Board-foot and cubic-foot volumes per acre are extremely variable for seedling and sapling and poorly stocked stands. The volume sampling errors for these stand-size classes are erratic and may be from 25 to 100 percent higher than the area sampling errors.

EXPLANATION OF TERMS USED

AREA

Land area.--Includes dry land and land temporarily or partially covered by water, such as marsh land, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds having less than 40 acres of area. (See "Areas of the United States, 1940," page 2, U. S. Bureau of the Census.) Does not include water areas larger than those defined above nor deeply indented embayments and sounds and other coastal water behind or sheltered by headlands or islands separated by less than 1 nautical mile of water; and islands having less than 40 acres of area.

Forest area.--Land bearing forest growth or land from which the forest has been removed but which shows evidence of past forest occupancy and which is not now in other use. Except for right of ways of active power lines, highways, roads, and railroads that are not abandoned, strips of nonforest land less than 100 feet wide and areas less than 1 acre surrounded by forest were classified as forest.

Commercial forest area.--Forest land bearing or capable of bearing pole-timber or saw-timber stands of commercial character and economically available now or prospectively for commercial use and not formally withdrawn from such use.

Noncommercial forest area.--Two classes of forest land are included: (1) reserved productive--forest land bearing or capable of bearing pole-timber or saw-timber stands of commercial character but formally withdrawn from commercial use for parks, preserves, wilderness areas, and so forth; and (2) nonproductive--other forest land permanently incapable of producing commercial pole-timber or saw-timber stands. The latter areas are either rocky, mountainous, or do not possess the climate and soil qualities essential for the production of commercial timber crops.

Nonforest area.--All land areas other than forest, including the acreage in cultivation and pasture less than 30 percent covered by tree canopy; land enclosed within the right of ways of active power lines, highways, roads, and railroads; abandoned roads when the soil has been removed or the pavement remains, marshes, bare rock, quarries, coal strippings, and gravel pits; water areas such as lakes, reservoirs, and ponds having less than 40 acres of area, and streams, sloughs, estuaries, and canals less than one-eighth mile in width (larger water areas are classified as "inland water" by the Bureau of the Census and not included within land area figures); and urban and other residential and industrial areas. Narrow belts of trees such as fence rows and stream margins less than 100 feet in width and small groups of trees less than one acre in area that are surrounded by nonforest land are considered nonforest.

FOREST TYPE GROUPS

(Board-foot volume of each species in saw-timber stands and number of stems in other stand-size classes was the basis for forest type classification. Table 4 shows the area of the detailed forest types that are combined in each forest type group. Table 22 gives the species composition of each forest type group, expressed in percent of net cubic-foot volume.)

Softwood.--Two types are included: the spruce-hardwood, in which spruce makes up 50 to 74 percent of the stand, usually in association with hardwoods; and the hemlock, with this species pure or predominating.

Northern hardwood.--The northern hardwood type, made up largely of beech, yellow birch, and sugar maple, is the principal one in this group. A small area of aspen type is also included.

Cove hardwood.--A mixture of hardwoods usually found on the deep moist sites of the coves and along the lower slopes. Yellow-poplar usually occupies a prominent position in these stands and is variously combined

with beech, red oak, hickory, sugar maple, and other hardwoods. A small area of the river bottom hardwood type is included.

Oak-hickory.--Includes stands dominated principally by oak in association with hickory and other hardwoods.

STAND-SIZE CLASSES

(The minimum area classified according to stand-size was 1 acre.)

Medium and heavy saw-timber stands.--Stands that had a net volume of 5,000 board feet or more per acre.

Light saw-timber stands.--Stands that had a net volume of 1,500 to 4,999 board feet per acre.

Pole-timber stands.--Stands that had a net volume of less than 1,500 board feet per acre and at least 10 percent of the area covered by the crown canopy of pole-timber or larger trees. At least one-half the minimum stocking was in pole-timber trees. These stands generally contained at least 200 cubic feet in trees 5.0 inches and larger, d.b.h.

Seedling and sapling.--Stands that did not qualify either as saw timber or pole timber but well stocked with seedlings and saplings (at least 40 percent of the stand area covered by crown canopy). These stands generally contained at least 300 seedlings and saplings 1.0 to 4.9 inches d.b.h. per acre.

Poorly stocked stands.--Stands that did not qualify as saw timber or pole timber but were at least 10 percent stocked with saw-timber or pole-timber trees or with 10 to 39 percent of the crown canopy in seedlings and saplings.

Unstocked areas.--Stands that did not qualify as saw timber, pole timber, or seedling and sapling, and were less than 10 percent stocked.

SITE CLASS

Site class.--Based on the average number of logs produced by mature trees in commercial forest areas. Where mature, dominant, or codominant trees were present, the following merchantable height classes,

based on 16-foot logs, were used:

Site	Hardwoods	Softwoods
Good	3 or more logs	5 or more logs
Fair	1½ to 3 logs	3 to 5 logs
Poor	8 feet to 1½ logs	8 feet to 3 logs
Nonproductive	(See definition under AREA.)	

Where no mature trees of the dominant or codominant crown classes were present, site was estimated from the species and growth of immature trees, the depth and type of soil, aspect, soil moisture, and the shrubby and herbaceous ground cover. Poor sites that are incapable of producing pole-timber or saw-timber stands were classed as nonproductive (noncommercial forest area).

VOLUME ESTIMATES

(Volume in trees on areas classified as nonforest is not included; all volumes are net, that is, with defect deducted.)

Board-foot volume.--Includes the sawlog material in saw-timber trees estimated through use of the International 1/4-inch log rule which closely approximates green lumber tally for square-edged boards. Merchantable heights for sawlogs were estimated to the point at which utilization is limited by large branches, forks, or deformities, or a d.i.b. of not less than 6 inches for softwoods and 8 inches for hardwoods. Deductions have been made for rot, crook, and other defects.

Cubic-foot volume.--Includes the sound wood, excluding bark, in: (1) the sawlog portion of saw-timber trees, (2) the upper stems of softwood saw-timber trees and the upper stems and limbs of hardwood saw-timber trees to a minimum of 4 inches inside bark, (3) the full stems of pole-timber trees to a minimum of 4 inches inside bark, and (4) the sound wood volume of cull trees. No deductions were made for defects unless they affected the wood structure.

Volume in cords.--This volume was derived from the net cubic-foot volume (excluding bark) by applying a factor of 78 cubic feet per cord for softwoods and 65 cubic feet per cord for hardwoods. Although the number of cubic feet per cord varies with size of material, these converting factors were used for all material in this report. The resulting figures approximate the volume of a standard stacked cord (4 feet by 4 feet by 8 feet), including bark. No deductions were made for defect unless they affected the wood structure.

TREE CLASSES

Saw-timber tree.--A softwood tree at least 9.0 inches d.b.h. (diameter outside bark at 4½ feet above the ground on the upper side of the tree) or a hardwood tree at least 11.0 inches d.b.h. with a sound log at least 8 feet long and with at least half of the gross volume of the tree in merchantable material.

Pole-timber tree.--A tree that ranged from 5.0 inches d.b.h. up to a minimum saw-timber tree size and that gave promise of becoming a merchantable saw-timber tree.

Cull tree.--A tree that did not qualify as a saw-timber or pole-timber tree because of poor form, limbiness, rot, or other defect.

Tree-diameter class.--Each 2-inch diameter class includes trees measured in the range from 1.0 inch below the midpoint of the class up to but not including 1.0 inch above the midpoint. For example, the 6-inch class includes trees whose d.b.h. fall in the range of 5.0 inches up to but not including 7.0 inches.

SPECIES

The various tree species found in this area are listed below. Approved common names 1/ are shown in parentheses if these differ from the brief name used in the tables. Approved scientific names 1/ are underlined. If two or more species are included under a single name in the tables, the various species are listed or the word "species" appears after the approved scientific name for the genus.

Softwoods

Spruce (Red spruce)	- Picea rubens
Hemlock (Eastern hemlock)	- Tsuga canadensis

Hardwoods

Sugar maple	- Acer saccharophorum
Red maple	- Acer rubrum
Red oak (Northern red oak)	- Quercus borealis
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
White oak	- Quercus alba
Chestnut oak	- Quercus montana
Yellow birch (Yellow birch)	- Betula lutea
(Sweet birch)	- Betula lenta

1/ U. S. Forest Service. Check list of the native and naturalized trees of the United States including Alaska. U. S. Dept. Agr. 325 pp.1944.

Hardwoods (Continued)

Beech (American beech)		- Fagus grandifolia
Ash		- Fraxinus species
Basswood (American basswood)		- Tilia americana
Black cherry		- Prunus serotina
Yellow-poplar		- Liriodendron tulipifera
Hickory		- Carya species
Buckeye (Yellow buckeye)		- Aesculus octandra
(Ohio buckeye)		- Aesculus glabra
Elm		- Ulmus species
Gum (Blackgum)		- Nyssa sylvatica
Black walnut		- Juglans nigra
Black locust		- Robinia pseudoacacia
Other hardwoods	(Bigtooth aspen)	- Populus grandidentata
	(Quaking aspen)	- Populus tremuloides
	(Butternut)	- Juglans cinerea
	(Pin cherry)	- Prunus pennsylvanica
	(Honeylocust)	- Gleditsia triacanthos
	(Eastern hophornbeam)	- Ostrya virginiana
	(Sassafras)	- Sassafras albidum
	(Downy serviceberry)	- Amelanchier arborea
	(Sourwood)	- Oxydendron arboreum
	(Cucumbertree)	- Magnolia acuminata

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